CHRONICLE OF THE VI CONGRESS OF ALL-UNION HYDROBIOLOGICAL SOCIETY

Irena V. Telesh

Zoological Institute of Russian Academy of Sciences, 199034
St. Petersburg, Russia

ABSTRACT. Recent investigations in water ecology, presented at the VI Congress of All-Union Hydrobiological Society (Murmansk, October 8-11, 1991) are reviewed. The most actual problems discussed at the Congress were the following: productivity of the ocean and rational utilization of its biological resources; hydrobiology of coastal waters and estuaries; the ecological basis of fishery in continental water bodies; water toxicology and radioecology; ecological physiology and biochemistry of aquatic organisms; structure and dynamics of populations and communities of aquatic organisms; production and destruction in water ecosystems and microbiology of water bodies; complex hydrobiological investigations and the problems of ecotones in fresh waters.

Key words: congress, Hydrobiological Society, chronicle

Sixth Congress of All-Union Hydrobiological Society (AUHS) was held in Murmansk in October 8-11, 1991. Among 302 participants of the Congress, there were 257 delegates who represented 3800 members of the AUHS from 69 departments. 150 communications were presented at 4 plenary sessions and 8 thematic sections, though a total of 386 lectures were announced.

The lectures presented at the plenary meetings were the following: G. G. Matishov "The state of ecosystem of the Barents Sea and the ways of its protection"; P.A. Mojesejev "Current state and the basic tendencies of development of aquaculture in the world"; G.I. Luka "The state and tendencies of changes of the biological resource stock in the Barents Sea"; L.M. Sushchenya, V.A. Abakumov, D.S. Pavlov "The ecological status and hydrobiological monitoring of the USSR water bodies"; A.F. Alimov "The basic points of the theory of functioning of water ecosystems"; L.A.Kuderski "The condition of fish stock in continental water bodies in connection with ecological changes"; V.I. Lukjianenko "On the general conception of water body protection from pollution in the USSR"; A.V. Zhirmunski, V.G. Tarasov, N.K. Khristoforova "Hydrothermal ecosystems of the Kraternaja Bay and coastal regions of South-Western Pacific"; I.I. Gitelzon, M.I. Gladyshev, A.D. Degermendgi, L.A. Levin, F.Ya. Sidko "Ecological biophysics and its role in the study of aquatic animals"; L.V.Polishchuk "The balance approach and population analysis: two trends in water ecology".

The very intensive program of the Congress and the fact of simultaneous work of all the sections hamper the detailed analysis of all communications. So I shall try to generally characterize the main results of hydrobiological investigations which were discussed at the sections.

Section "Productivity of the Ocean and rational utilization of its biological resources" considered the broad range of basic problems of investigating the biological structure of the Ocean and the processes determining productivity of its regions. Use of ecosystem approach in the estimation of withdrawal of food animals allowed to achieve good results in marine fish-breeding (S.S. Drobysheva; A.A. Neiman, V.Ya. Pavlov, A.A. Rusakyavichus, M.L. Kangur; and others). Studies of ocean ecosystems successfully generalize various experiences in the investigation of human influence on their productivity (A.P.Aleksejev).

Section "Hydrobiology of coastal waters and estuaries; ecological basis for sea aquaculture" combined the results of investigations in littoral zone of the seas, in estuaries and the inner seas. General approaches to the formation of united basis of data for the investigation of Arctic marine ecosystems were proposed by G.G. Matishov and his colleagues. Several investigations were devoted to systematic analysis of production processes which promotes the elaboration of scientific basis for rational harvesting of animal community (A.N. Golikov et al.; V.V. Andrejeva et al.; R.M. Lim, Z. Jermahanov; and others).

Recent intensification of water pollution in river basins became the main cause of toxic water flow to the marine coastal waters (V.D. Romanenko, V.M. Timtchenko). Under conditions of

growing anthropogenic load on the ecosystems of inner seas and coastal waters, it is very important to investigate the optimal conditions for development of water communities (N.V. Aladin; G.P. Andrushaitis et al.).

The progress in aquaculture was based on the elaboration and introduction of new biotechnology, for example, for cultivation of various molluscs and other food organisms (M.S. Selina, and others). Interesting data on successful acclimatization of the grey mullet from the Far East into the Sea of Azov were presented by L.I.Semenenko.

Fish-breeding investigations in the continental waters were discussed at the meetings of section "The ecological basis for utilization of fish in fresh water bodies". Current condition and prospects for development of various branches of fish-breeding (fishering, fattening fish-breeding, pond and industrial rearing of fishes) were estimated by L.A.Kuderski. Much attention was paid to the study on the influence of economic activities on the fish populations and stock. These investigations not only state the negative effects of pollution but also develop the basis for methods of their neutralization and ways of restoration of the endangered species abundance (V.N. Polymski and M.I. Rozhdestvenski; Z.M. Kulijev; V.Ja. Pervozvanski; G.K. Kamilov et al.; A.G. Garulaitis et al.; N.S. Kirilenko et al.; E.V. Kozhokaru et al.; L.N. Solovkina; N.V. Starko, and many others).

Thus, the complex of investigations of ecological aspects of the fish stock exploitation in fresh waters becomes a separate scientific discipline. It includes the development of theoretical basis and practical recommendations for the freshwater aquaculture, which is one of leading branches of the economic utilization of water ecosystems production.

The main problems considered at the section "Water toxicology and radioecology" were the following: the intensity and mechanisms of effect of pollutants on aquatic organisms and communities, the means of pollution exposure, the elaboration of biological methods for standartization and control of pollution, as well as forecasting and preventing the after-effects of pollution.

One of most important fields of these investigations is the registration of the quality and concentration of toxic substances in the water and compiling of ecological "passports" of natural water bodies (E.A. Bogdanova and M.A. Perevoznikov). Intensification of human interference into the natural process of ecosystem development (such as mechanized dredging, growth of sewage from the densely populated areas, farms and industry) causes irreversible biotic and abiotic changes leading the ecosystems to the verge of collapse (L.A. Lazauskene et al.). Use of the biogeographical principle for regulation of pollution, could probably help to avoid critical situations in ecosystems (I.V. Volkov et al.). These examples were taken into account by L.P. Braginski and his colleagues while they worked out the principles of eco-toxicological information system for the hydrosphere. The results of fundamental researches were also used for improving the theory of water toxicology: for concretizing such basic concepts as sensibility and stability, standards and pathology, criteria of toxicity, and many others.

Section "Ecological physiology and biochemistry of aquatic organisms" was the place of discussions on the problems of physiological and biochemical mechanisms of animal adaptations to the environvental factors, eco-physiological aspects of metabolic processes, bioenergetics and endocrinology. The methods of electrophoresis, gas-chromotography and spectrophotometry were widely applied for solving the above mentioned problems (V.I. Ponomaryov; S. A. Sarkisyan et al.). New data were obtained on the heterogenity and polymorphism of haemoglobins, serum and tissue proteins (R.A. Nasyirov; S.S. Misiryan). Physiological and biochemical peculiarities of sturgeons associated with their new disease exposed in exfoliation of muscles and softening of spawn cover were studied by V.I. Lukjanenko and his colleagues. Biochemical indicators of the organism growth rate suitable for characterization of ecosystems were proposed by A.G. Vasenko et al. The authors proved that the growth rate of aquatic organisms positively correlates with the concentration of collagen in skin, and negatively correlates with the collagen concentration in bones.

Bioenergetic studies are developed under the influence of ideas of our great scholars V.S. Ivlev and G.G. Winberg, and their successors. These investigations shed light on biochemical and physiological mechanisms and peculiarities of substance and energy transformation in the ecosystems; they form the basis for regular monitoring of food invertebrates and fish stock (G.E. Shulman et al.).

The data presented at the section "Structure and dynamics of populations and communities of aquatic organisms" elucidated the problems of species autoecology (N.Ju. Sokolova; F. Akhrorov; L.A. Bazarkina), regional ecological and faunistic studies (N.M. Pronin and S.V. Pronina; A.V. Kovalyov et al.; S.I.Mazhekajte et al.). Regularities of the phytoplankton horizontal structure were considered by L.G. Korneva.

Peculiarities of the plankton community functioning in hypertrophic lakes were described by N.M. Kryuchkova and L.V. Kamlyuk. The structure and functional relations in populations and communities were studied in different waters (G.A. Galkovskaja; L.M. Suschenya and V.P. Semenchenko; P.I. Krylov; E.A. Kurashov, and others). A theoretical model for eco-genetic control of dynamics of animal numbers was proposed by G.V. Grechanyi and I.A. Sosunova. There were numerous researches of prognostic character.

Investigations of primary production and destruction of organic matter in lakes and running waters were discussed at the section "Production, destruction and microbiology of waters". Much attention was paid to one of poorly studied and methodologically difficult problems, namely the estimation of biotic balance in running waters (Ju.M. Lebedev). Aims, purposes and perspectives of application of the fluorometric method for estimation of development and functioning of algae were characterized in details by L.A.Sirenko.

Investigations of energy flow through detrital and grazing food webs were closely connected with the study of microbiological processes and their role in the destruction of organic matter, as well as with processes of consumption and excretion of phosphorus by autotrophic and heterotrophic components of microplankton. Several authors showed that functioning of bacterial communities in plankton and benthos of lakes, as well as in natural or artificial flows can serve as an indicator of pollution in ecosystems (V.G. Drabkova; G.H. Olejnik; G. H. Springe).

The necessity of taking into account the peculiarities of productional processes in the littoral zone before choosing the way of human interference into the water ecosystem was substantiated by S.M. Golubkov with co-authors.

Wide range of problems was elucidated at the meetings of section "Complex hydrobiological investigations and the problems of ecotones in fresh waters". It was stated, in particular, that the questions of functioning of water communities in the zones of ecotones require further elaboration (T.A. Kharchenko; L.N. Zimbalevskaja et al.). Progress in solving these problems could yield good results in modelling the stressed ecosystems.

Several contributions presented the results of complex ecosystem envestigations or studies of communities that are under the extraordinary antropogenic influence, e.g. the Neva Bay and the eastern part of the Finland Gulf of the Baltic Sea (V.N. Nikulina), cooling reservoirs of the nuclear and other electric power stations (V.N. Tsymbal et al.; G.M. Lavrentyeva et al.).

The necessity of elaboration of common scientific methods for estimation of detriment, caused by technological impact, was stated to be urgent. Thus, the first symptoms of acidification and ecological regress in some Karelian lakes were revealed basing on the analysis of alterations in ecosystems from the view-point of ecosystem metabolism, its level and trend (V.A.Abakumov et al.). A new method of controlling the environmental conditions based on ecological modifications of the macrophyte associations was proposed by A.I. Merezhko and I.M. Raspopov. The advantage of this method consists in the presence of macrophytes in almost all waters. The method allows not only to record the initial stage of the ecosystem alteration, but also to predict the trend of its development.

So, even the brief review of data contributed to the VI Congress of AUHS shows that hydrobiological investigations became more profound during the last five years, new methods were applied, and new branches appeared in water ecology, which can be considered as the fundamental discipline of great practical importance. Remarkable progress was achieved in the uniting the population analysis with classical productional hydrobiology; basic points of the theory of water ecosystem functioning were formulated. For the purpose of saving the genofond of rare and endangered species of aquatic plants and animals, the correlated development of population ecology and genetics is actually necessary. The processes of pollution are also in the focus of attention of water ecologists.

Meantime it should be noted that the VI Congress of AUHS was held in a very complicated period for the Academy of Sciences of the USSR (the Hydrobiological Society was a part of it), as well as for the country on the whole. Nevertheless, the questions raised at the Congress, and hot discussions at section meetings showed the necessity of further profound, versatile, and coordinated investigations in water ecology. At present, it is extremely important that the reforms in the Academy of Sciences and its Scientific Societies should not become an obstacle for the complex hydrobiological studies, targeted to solving such global and urgent problems as the control of progressing eutrophication, pollution, and toxication of waters.

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